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To
C. S.
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Dear Charlie,

Have not heard from you in some time & wondered what was up. Jenkins came in to-day saying he had talked with you. I didn't get too well from him so would appreciate a direct report (his, coming or what have you?).

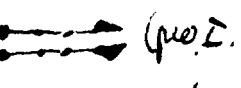
I have been busy as can be. Classes have been tribbles this term. There are 3 sections meeting twice a week or 6 lab periods for me. So far it has been almost my total energy consumer but lately I have found time to work on yours & my material. Loads of new things have turned up and I will try to tell you some.

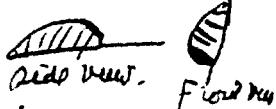
To start with - I believe I have all (probably) of the chromosomes isolated. This spring I isolated 2, 3, 4, 5, & know where 8, & 9 are. I assume 10 is 5-62. Found them up in your trisomics. Chromosome #6 makes the plants look like bz plants - dwarfish, thick stems, thickish wide leaves which are very small near the top.

This varies, however, from such an extreme expression of the characteristics of lack of inter nodal elongation that the leaves hardly come out of the upper leaves to almost normal plants. I had the satellite cl. + #6 in a trecome in the garden (219 A₅), & thus was able to distinguish Trecomia satellite plants from trecome #6 plants. I have @ the most striking plants to see if this is a separation of 211 : 211+1 for this characteristic.

I believe also that the satellite cl. will turn out to be the 4-pl group. I have negative evidence for 1a + some very positive evidence for 4. That should be finished quite soon but you can plan somewhat on 4-pl for your satellite sterile.

Have some good evidence on the satellite - quite different but I shall not be certain of all for a time yet - The rest of the sat. cl., not the satellite is the important part.

attaches
to satellite The satellite is made up of  (p.c.).

Long Proj. satellite prefer. 4 chromosomes, a large  side view. front view. Chromosome, behind two smaller granules & behind this a larger granule. From this granule to the end of its chromosome is a region I have not made up my mind about as yet. The end of the satellite, attached to the nucleolus is & relatively free of chromatin. It forms two bodies visible in late pro. of spor. if detached from the nucleolus. (see photo graph). The satellite prefers "wags" in early

prophase of Meiosis. I do not believe it is the important part of attachment of chromosomes to nucleolus. I have studied, slightly, trisomic satellites at early prophase & they are very interesting. Two threads are together & the third is free but still seem to be together at the nucleolar area of the cell. It must leave anyway. I have more plants growing for this in the green house now which will be along after you arrive so you can see it all. So much for the satellites.

Now for the constrictions. I have just touched on them but they are easily workable & very good. In early prophase I think they can be followed in some cases totally & the constrictions are observed. It is a homogeneous area with a granule in the center. The stainable chromosome does not seem to be there & that stops short before at this region. That is probably why we have ~~some~~ lower at the constrictions area - (chromosome with chromosome) The granule, not like a homogeneous constriction area with chromosome, is probably granule.

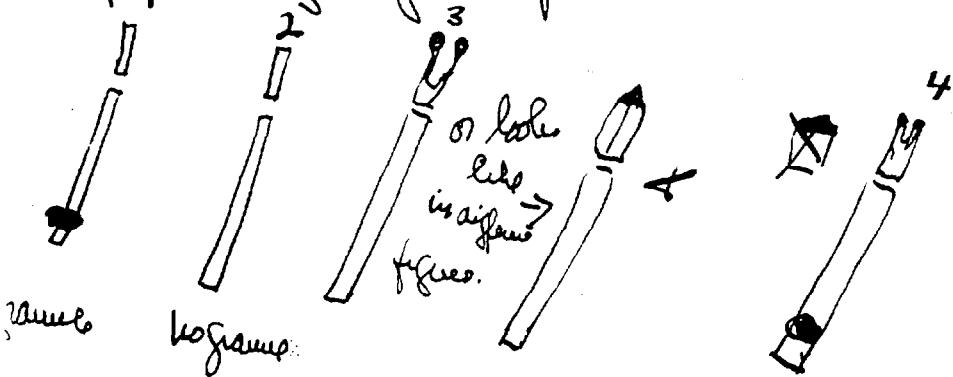
the point of spindle fibers attachment.

Now for the nature of bivalent chromosomes. They are 8 parted, not 4 parted. That is, they are 8 strands, four to each chromosome. I hope to get some photos of this.

Now for heteromorphic chrs:

The chromosomes you brought from Wisconsin are very heteromorphic when crossed to some of our materials. This may not be totally so but in your stains (~~unfortunately~~) in some of ours) there are no granules at end of the satellite chrs. as in some or most all of the material I have looked at in our material. I have a slightly different method that should ~~show~~ clos. very much better. In cases of two types there are heteromorphic granules.

These are very evident in Early p. I & clear at D.K. They are the things that caused our confusion last summer & all my confusion of positions of granule & presence on different chrs. They are present on any chrs. possibly ~~but~~ ~~but~~ apparently from different sources but not on the same chrs. from all sources. That is, there is not a chromosome morphology in corn but chromosome morphologies. At first I was pretty well confused but things are clearing. For instance there are the following types of #4 chrs:

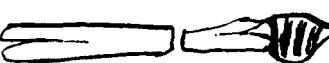


I have crossed type 1 with type 3 to get  which will have none crossing-over, cytologically; I hope. I may not get any seed but will repeat the cross in the field

I have 2 types of #2, 2 types of satellite cles, 3 types of #6, 2 types of #9 + 3 types of #10. I can find heteromorphosis extending even to chloronemes which is characteristic & not very hazard, I believe.

Now for what you really are interested in & you which I have spent most of my efforts & am just seeing light. It has been an aggression because I was working with this crazy heteromorphosis & couldn't distinguish correctly. I believe I am half way along on it now. I don't believe I can distinguish how much of each cle. has been interchanged by direct pollination & spores but we may work if from pro & by synapsis extracts which do show up in some case but the rings of e-sh-w. is made up of 2 cles, one below, going to $[10]_2$ & one to 3 or 4. I have taken plants from your various e-sh-w. plant & grown them. They should give 2 types of 2n+1 type. one with one of the cles. + one with the other. I have found without any doubt that #2 is involved & that the cles. coming from your original plant are identifiable from those coming from the pollen parent.

(With love from looking at it.)

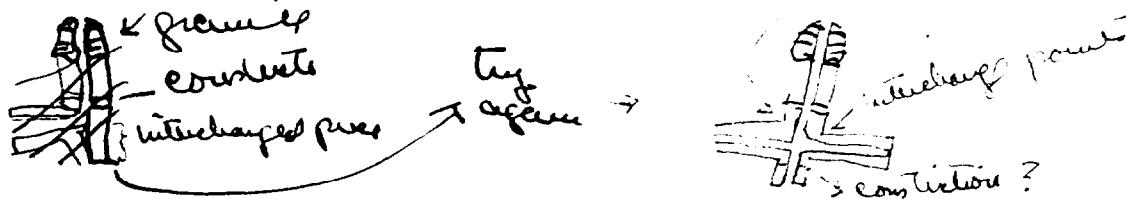
Chr. #2 seems quite large
 #2 seems different - no
 large at me. due
 possibly to difference in
 concentration. This I don't know. The chromosome
 with which it forms a ring is larger & possibly #3.
 I have made some observations which indicate #3.
 I have, however, crossed $2n+1$ (#4) with $x-n_2$ +
 have the ears $2n+1$ (#1) \times $\frac{1}{2}n_2$. In the rings in
 the material I grew there is a decided difference in size
 of the two #2 chrs. Whether this is due to heteromorphism
 or to unequal interchange, I have not as yet determined.
 There is one trouble which I will attack in the next
 few days. Do you remember the chr. in Brink's
 $\frac{1}{2}n_2$ which I thought #2 with a large terminal
 granule?  It is running there your
 material & still looks like #2 but there is some
 conflicting evidence. It is involved, probably, in your
 interchanges. I took normal material, observed spores &
 found some with this & some without. I then looked
 at K & found a heteromorphic pair which looked
 like like #2 than any thing else. However, in your
 material this chr. seems to be the larger one of the 2 rather
 than #2. In K we have this: 
 [exhibited different in size of chr.]
 smaller \rightarrow concentration, main one con
 appears bivalve \rightarrow probably constricta.

5

Besides this ring there is a small elv. which is very probably #1 or n-s. Since #2 is involved in the ring I have to look at the spores in this plant to be sure the ^{terminal} granule is the same or just what has happened. I hope to know in a few days. You see, I have it solved the situation totally but have opened up some new things which are very valuable, cytologically, & I sincerely think I can solve a lot more & it is turning out more interesting than I had anticipated, even; at least I feel more confident than I did 10 days ago when I felt I had hopelessly failed to solve anything. This is only part of the story. There is more I could tell you, but I shall wait till things are more coordinated & the story is more complete, if I can make it so. As it is I have the terminal granule to solve. It

This is what I believe we can find out:-

- ① Differences in sizes of interchanges
- ② How elvs are synapred in ring, i.e., their construction position
- ③ Possibly how far up the elv. the interchange goes by:



This is just a diagram & does not represent the case as I believe it to be. We should be able to orient ourselves by granules - there are several large enough to be identifiable - including constrictions.

Also - I believe that the elv. involved besides c-sh-ux
may be 2-tw or negative numbers. So far it looks
as if 2 or 3 is ~~c-sh-~~ 2w-tw as it doesn't seem to be
any of the others, i.e., if the elv. besides #2 in your sketch
is actually #3. + not #4. I see I am rambling
again but you are familiar with my wanderings
+ know how much to sift them. (Ha ha!)

I have had wonderful - (+ all superlatives words)
preparations of elv. I have just begun taking a few
photographs + will enclose a couple. I have on slides
of photographs that show well all the elv. in a single
space in pro. My original diagram is all right, though
I don't know to what extent heteromorphosis
is going to change things but probably not vastly.

So much for the news such as it is.

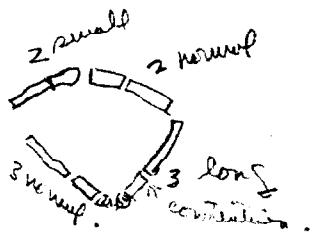
Let me know what you have —

Sincerely

Barb.

4/4/30

This is a post script but it is well worth adding -
Have worked on the steriles & have gone ahead -
The situation is somewhat like this:



Apparently #2 + #3 have subcultivations
+ #3 has taken over more than it has
given. About $\frac{4}{3}$ - $\frac{1}{4}$ of the lower
end of #3 is involved, probably.

In one batch of D₂ #3 has a long terminal granule & looks like this

As for the spores: I believe we can tell just how Symplois

takes place & how division occurs. The spores are of
several varieties. I have found that some of the steriles & spores
undergo the first division in the mesospores & should be
able to find spores with #1, no #2, two #3 with granule etc.
I have already seen this. Can calculate % of spore
with 1 terminal granule & % with 2. $\frac{1}{4}$ should have 2,
 $\frac{1}{2}$ one 1 + $\frac{1}{4}$ none. However, one combinatorial may
not go thru the first division as there is a so which I
have not calculated yet which do not go thru. Will
have more done in a few days.

Have not decided to send you the rest of pictures but
will only send one as you will be here so soon.

This is from one of your 30 So steriles but contains only one
in this particular spec. I took it for the difference between #1 &
#2.

